REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-11 are presently pending in this application, Claims 1-6 and 8-11 having been amended by the present amendment.

In the outstanding Office Action, Claims 1-11 were rejected under 35 U.S.C. §112, second paragraph, for being indefinite; Claims 9-11 were rejected under 35 U.S.C. §102(b) as being anticipated by Yamasaki et al. (U.S. Patent 6,177,005); Claims 1, 2 and 4 were rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent Publication Number 10-123118 (hereinafter "JP '118") in view of Miyamaru et al. (U.S. Patent 5,259,972); Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over JP '118 in view of Miyamaru et al. further in view of Lowther (U.S. Patent 4,101,296); and Claims 5-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dempo (U.S. Patent 5,512,178) in view of Obata et al. (U.S. Patent 5,571,419).

With regard to the rejection under 35 U.S.C. §112, second paragraph, Claims 1-6 and 8-11 have been amended to clarify the subject matter recited therein. Thus, Claims 1-11 are believed to be in compliance with the requirements of the statute. Also, these claim amendments are merely cosmetic and are not believed to narrow the scopes of the claims. If, however, the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work in a joint effort to derive mutually satisfactory claim language.

Briefly recapitulating, Claim 1 of the present invention is directed to an ultrapure water producing apparatus including an ultraviolet oxidation unit, an ion exchanger provided in a downstream side of a direction in which pure water flows from the ultraviolet oxidation unit, an oxidant decomposition unit for sampling pure water already undergone ion exchange

in the ion exchanger and decomposing oxidants included in sampled pure water into dissolved oxygen, a measuring device for measuring a first dissolved oxygen concentration in the pure water already undergone ion exchange and a second dissolved oxygen concentration in pure water already decomposed in the oxidant decomposition unit, and a calculation/control system for calculating a third dissolved oxygen concentration indicating a difference between the first and second oxygen concentrations and adjusting the amount of ultraviolet light of the ultraviolet oxidation unit based on the third dissolved oxygen concentration. By providing such a measuring device, the UV oxidation unit is controlled more appropriately in accordance with the effectiveness of the ion exchanger, thereby controlling impurities more appropriately.[1]

JP '118 discloses an ultrapure water producing apparatus. Nevertheless, JP '118 does not teach a measuring device for measuring a first dissolved oxygen concentration in the pure water already undergone ion exchange and a second dissolved oxygen concentration in pure water already decomposed in the oxidant decomposition unit, as recited in amended Claim 1. On the other hand, JP '118 discloses controlling an amount of UV irradiation from a UV oxidation unit 1 based on an amount of DO measured in a structure wherein a DO meter 4 is provided in an outlet of an ion exchanger 2, or in a structure where a DO meter 5 is provided in an inlet of the UV oxidation unit 1 located upstream of the ion exchanger 2 while at the same time a DO meter 4 is provided in an outlet of the ion exchanger 2. Therefore, although in JP '118, an amount of UV irradiation is controlled based on the amount of DO, JP '118 fails to disclose or suggest an oxidant decomposition unit for sampling pure water already undergone ion exchange processed at an ion exchanger and decomposing oxidants included in

[1] Specification, page 14, lines 1-19.

sampled pure water into dissolved oxygen. Therefore, the structure recited in Claim 1 is clearly distinguishable from JP '118.

Likewise, Miyamaru et al. disclose an apparatus for purifying water with an activated carbon tower for decomposing the ozone in the water passing through, but do not teach a measuring device for measuring a first dissolved oxygen concentration in the pure water already undergone ion exchange and a second dissolved oxygen concentration in pure water already decomposed in the oxidant decomposition unit, as recited in amended Claim 1. Thus, the structure recited in Claim 1 is also distinguishable from Miyamaru et al.

Furthermore, Lowther only discloses an ozone decomposition system and does not teach the measuring device as recited in Claim 1. Thus, the structure recited in Claim 1 is also distinguishable from Lowther.

Because none of JP '118, Miyamaru et al. and Lowther discloses the measuring device as recited in Claim 1, even the combined teachings of these applied references would not render the structure recited in Claim 1 obvious.

Turning to Claim 5 of the present invention, Claim 5 is directed to an ultrapure water producing apparatus including at least two ion exchangers provided in series, a main route provided to flow pure water in the order that the at least two ion exchangers are provided, and a plurality of bypass routes connected to the main route such that the pure water flows through the at least two ion exchangers in an order different from the order that the at least two ion exchangers are provided. By providing such bypass routes, when the ion exchangers are replaced alternately, and during the elution of a metal component from a new ion exchanger, its discharge can be supplied to the remainder of the ion exchangers to remove the

metal component, thereby preventing pure water containing the metal component to be supplied to the point in use.[2]

Dempo discloses a water treatment apparatus. However, Dempo does not teach a plurality of bypass routes connected to the main route such that the pure water flows through the at least two ion exchangers in an order different from the order that the at least two ion exchangers are provided, as recited in Claim 5. Instead, Dempo discloses a water treatment apparatus having the branching pipes 27a, 27b, 28 simply to direct the water 2 to either the high purification step B by the first UV irradiating unit 18 or the highly high purification step C by the second UV irradiating unit. Additionally, the ion exchange resin tower 20 is provided only after those steps B and C. Thus, the structure recited in amended Claim 5 is believed to be distinguishable from Dempo.

Obata et al. merely disclose a method of producing pure water in which the weak anion exchanger 26, the strong cation exchanger 27, and the strong anion exchanger 28 are provided in series, but do not teach a plurality of bypass routes connected to the main route such that the pure water flows through the at least two ion exchangers in an order different from the order that the at least two ion exchangers are provided, as recited in Claim 5. The structure recited in amended Claim 5 is therefore believed to be distinguishable from Obata et al.

Because neither Dempo nor Obata et al. disclose the bypass routes as recited in Claim 5, even the combined teachings of these applied references would not render the structure recited in Claim 5 obvious.

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[2] Specification, page 18, line 24, to page 19, line 4.

Claim 9 of the present invention is directed to an ultrapure water producing apparatus including a total organic carbon meter having a decomposing device configured to decompose an organic substance by applying ultraviolet light to pure water and configured to measure an organic substance concentration of carbon dioxide generated by the decomposing device, and an oxygen dissolution unit provided on an inlet side of the total organic carbon meter and configured to dissolve oxygen in the pure water to be supplied to the total organic carbon meter. By providing such an oxygen dissolution unit, oxygen or ozone necessary to decompose an organic substance is supplied before the pure water is introduced into the TOC meter, thereby allowing more complete decomposition of an organic substance at the TOC meter.[3]

The outstanding Office Action asserts that Yamasaki et al. disclose the ultrapure water producing apparatus as recited in Claim 9. However, Yamasaki et al. do not teach an oxygen dissolution unit provided on an inlet side of the total organic carbon meter and configured to dissolve oxygen in the pure water to be supplied to the total organic carbon meter, as recited in amended Claim 9. Instead, Yamasaki et al. only disclose the TOC meters 55, 68, 88, 108, 148, 178, 208, 238, 268, and the primary pure water producing unit 145 having the UV sterilization unit 167 connected to the electric deionization unit 166. Furthermore, Yamasaki et al. relate to a system for treating microbes and organic matters in the process of producing ultrapure water, disclosing a structure with a TOC meter for measuring the TOC in the water to be treated. However, Yamasaki et al. fail to disclose a structure with an oxygen dissolution unit for dissloving oxygen in pure water provided on an inlet side of the TOC meter as recited

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[3] Specification, page 20, lines 19-25.

in Claim 9. Hence, the structure recited in Claim 9 is clearly distinguishable from Yamasaki et al., and thus is not anticipated thereby.

For the foregoing reasons, Claims 1, 5 and 9 are believed to be allowable. Furthermore, since Claims 2-4, 6-8, 10 and 11 ultimately depend from one of Claims 1, 5 and 9, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 2-4, 6-8, 10 and 11 are believed to be allowable as well.

In view of the amendments and discussions presented above, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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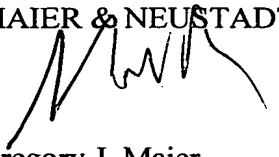

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IN THE CLAIMS

Please amend Claims 1-6 and 8-11 as follows:

--1. (Amended) An ultrapure water producing apparatus comprising:

an ultraviolet oxidation unit; [and]

an ion exchanger provided in [this order from the upstream] a downstream side of a direction in which pure water flows from said ultraviolet oxidation unit;

an oxidant decomposition unit for sampling pure water already undergone ion exchange in said ion exchanger[, thereby] and decomposing all of oxidants included in sampled pure water into dissolved oxygen; [and]

a [feedback system] measuring device for measuring a first dissolved oxygen concentration in said pure water already undergone ion exchange and a second dissolved oxygen concentration in pure water already decomposed in said oxidant decomposition unit; and

[to calculate] a calculation/control system for calculating a third dissolved oxygen concentration indicating a difference between said first and second oxygen concentrations[, thereby] and adjusting the amount of ultraviolet light of said ultraviolet oxidation unit based on said third dissolved oxygen concentration.

2. (Amended) The ultrapure water producing apparatus according to claim 1, wherein said [feedback system] measuring device including:

a first dissolved oxygen concentration meter for detecting said first dissolved oxygen concentration; and

a second dissolved oxygen concentration meter for detecting said second dissolved oxygen concentration[; and],

[a] wherein said calculation/control system [for calculating] calculates said third dissolved oxygen concentration upon receipt of data from said first and second dissolved oxygen concentration meters and [controlling] controls the amount of ultraviolet light of said ultraviolet oxidation unit.

3. (Amended) The ultrapure water producing apparatus according to claim 1, wherein said oxidant decomposition unit includes [a] an alkalizing system for alkalizing said sampled pure water already undergone ion exchange by introducing an alkali component.

4. (Amended) The ultrapure water producing apparatus according to claim 1, wherein said oxidant decomposition unit includes [a] an oxidant decomposing system [for bringing] which brings said sampled pure water already undergone ion exchange into contact with platinum or activated carbon.

5. (Amended) An ultrapure water producing apparatus comprising:

at least two ion exchangers provided in series;

a main route provided to flow pure water in the order that said at least two ion exchangers are provided; and

a plurality of bypass routes connected to said main route [for flowing] such that the pure water [in the] flows through said at least two ion exchangers in an order different from the order that [in which] said at least two ion exchangers are provided.

6. (Amended) The ultrapure water producing apparatus according to claim 5, wherein:

said at least two ion exchangers at least include[:] a first ion exchanger provided on [the uppermost stream] a most downstream side[;] in which pure water flows and a second ion exchanger [other than said first ion exchanger, discharging first processed pure water,];

said plurality of bypass routes at least include a first bypass route, a second bypass route and a third bypass route[,];

said first bypass route [supplying] is configured to supply [said] first processed pure water to said [at least two ion exchangers except said] second ion exchanger when said first ion exchanger is discharging said first processed pure water[,];

said second bypass route [sending,] is configured to send [to said main route,] second processed pure water to said main route when [discharged from said at least two ion exchangers except] said second ion exchanger [which have been] supplied with said first processed pure water[, and said third bypass route supplying] is discharging said second processed pure water; and

said third bypass route is configured to supply pure water to [each of] said at least two ion exchangers except [said first] an ion exchanger provided on a most upstream side in which pure water flows.

8. (Amended) The ultrapure water producing apparatus according to claim 6, wherein:

said main route includes a plurality of main route valves provided [on its route] for interrupting supply of pure water to said at least two ion exchangers by each one of said at least two ion exchangers[, wherein]; and

said plurality of main route valves are [closed] configured to close when flowing pure water through said first to third bypass routes.

9. (Amended) An ultrapure water producing apparatus comprising:

a total organic carbon meter [for] having a decomposing device configured to decompose an organic substance by applying ultraviolet light to pure water[, thereby measuring] and configured to measure an organic substance concentration of [generated] carbon dioxide generated by said decomposing device; and[, wherein said total organic carbon meter includes]

an oxygen dissolution unit provided on an inlet side of said total organic carbon meter and configured to dissolve [pure water for dissolving] oxygen in the pure water to be supplied to said total organic carbon meter.

10. (Amended) The ultrapure water producing apparatus according to claim 9, wherein said oxygen dissolution unit includes a bubbling system for bubbling, in pure water, oxygen gas or ozone gas[not including an organic substance].

11. (Amended) The ultrapure water producing apparatus according to claim 9, wherein said oxygen dissolution unit includes a cooling system for cooling pure water supplied to said total organic carbon meter, thereby supplying cooled pure water with oxygen gas or ozone gas[not including an organic substance].--